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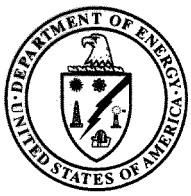
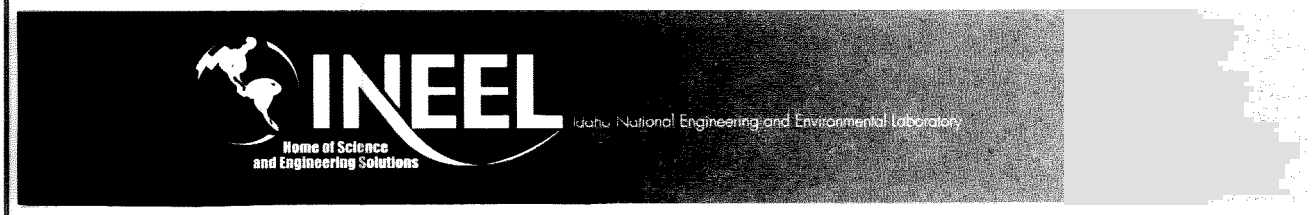


U.S. Department of Energy
Idaho Operations Office

Waste Acceptance Criteria for ICDF Evaporation Pond (Title I)



DOE/ID-10866

Waste Acceptance Criteria for ICDF Evaporation Pond (Title I)

July 2001

Prepared for the
U.S. Department of Energy
Idaho Operations Office

ABSTRACT

The Operable Unit 3-13 Record of Decision requires Comprehensive Environmental Response, Compensation, and Liability Act remediation wastes generated within the Idaho Nuclear Technology and Engineering Center boundaries to be removed and disposed of on-Site in the INEEL CERCLA Disposal Facility. The major components of the INEEL CERCLA Disposal Facility are the disposal cells, an evaporation pond, and the Staging, Storage, Sizing, and Treatment Facility.

The evaporation pond is designated as a Corrective Action Management Unit in accordance with the substantive requirements of IDAPA 58.01.05.008 (40 CFR 264.552 and 40 CFR 264 Subpart K and CC) for the purpose of managing INEEL CERCLA Disposal Facility landfill leachate and other aqueous wastes generated as a result of operating the INEEL CERCLA Disposal Facility Complex (Operable Unit 3-13 Record of Decision). The evaporation pond will accept INEEL CERCLA Disposal Facility leachate and potentially contaminated aqueous waste streams generated from Idaho Nuclear Technology and Engineering Center and other Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation, and Liability Act actions.

The purpose of this waste acceptance criteria is to provide the basis for the quantities of radioactive and non-radioactive contaminants of concern that may be present in the aqueous wastes disposed of in the INEEL CERCLA Disposal Facility evaporation pond and the basis for its operation. The aqueous wastes will include leachate from the INEEL CERCLA Disposal Facility landfill, purge and development water from monitoring well drilling operations, and secondary aqueous wastes generated from waste processing and decontamination activities in the Staging, Storage, Sizing, and Treatment Facility and other Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation, and Liability Act projects.

Compliance with the requirements of the evaporation pond waste acceptance criteria will ensure protection of human health and the environment. This document defines responsibilities, identifies the waste acceptance process, and provides the regulatory citations used in the development of the evaporation pond aqueous waste acceptance criteria, and the acceptable numerical concentrations for the waste constituents.

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ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
CAMU	Corrective Action Management Unit
cm/sec	centimeters per second
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOE-ID	Department of Energy-Idaho Operations Office
DQO	Data Quality Objectives
EDF	Engineering Design File
EPA	Environmental Protection Agency
ER	environmental restoration
FGE	fissile gram equivalent
GCL	geosynthetic clay liner
HDPE	high-density polyethylene
HWMA	Idaho Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDW	investigation-derived waste
INEEL	Idaho National Engineering and Environmental Laboratory

INTEC	Idaho Nuclear Technology and Engineering Center
LDR	land disposal restriction
mm	millimeter
m/Rem	millirem
NESHAP	National Emission Standard for Hazardous Air Pollutant
O&M	Operation and Maintenance
OU	operable unit
PCB	polychlorinated biphenyl
PPE	personal protective equipment
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RD/RA	remedial design/remedial action
ROD	record of decision
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSSTF	Storage, Staging, Sizing, and Treatment Facility
TAN	Test Area North
TRA	Test Reactor Area
TRU	transuranic
TSCA	Toxic Substances Control Act
VO	volatile organic
WAC	waste acceptance criteria
WAG	Waste Area Group
WMP	Waste Management Plan

NOMENCLATURE

The following definitions are presented as an aid to reader understanding of technical and scientific terms used within this document.

Analytical Residue and Sample Preservative Residue: Aqueous and organic solutions from sample preservatives and analytical residue generated from field preparation and laboratory analyses.

CERCLA-derived remediation and removal wastes: Wastes from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities that may include, but are not limited to, soil, water, contaminated personal protective equipment (PPE), filters, and other support equipment that cannot be decontaminated.

Construction wastes: Wastes generated during the on-Site construction of environmental remedial action activities.

Contaminated media/contained-in policy: All media contaminated with listed waste excavated prior to characterization will be assumed to contain listed waste.

Drill cuttings: Cuttings generated from well installation activities. Perched water and Snake River Plain Aquifer (SRPA) water well installation is expected to generate a substantial volume of drill cuttings.

Facility: An area within the boundaries of a Department of Energy (DOE)-controlled site that is access-controlled to prevent public access, for example, Test Reactor Area (TRA), Idaho Nuclear Technology and Engineering Center (INTEC), and Test Area North (TAN).

Free liquids: Liquids that can readily separate from the solid portion of a waste under ambient temperature and pressure (DOE Order 435.1), as demonstrated by "EPA Paint Filter Liquids Test Method 9095."

Hazardous substances: Any material designated as such pursuant to the CERCLA, including all Resource Conservation and Recovery Act (RCRA) hazardous wastes, radionuclides, a variety of other chemical substances, and any material identified as a hazardous substance such as petroleum, petroleum products, and all hazardous wastes.

Hazardous waste: Waste designated as hazardous by the Environmental Protection Agency (EPA) regulations (40 CFR 261.3) and regulated under Resource Conservation and Recovery Act (RCRA).

High-level waste: Highly radioactive waste material. High-level waste results from the reprocessing of spent nuclear fuel, including the liquid waste produced directly during reprocessing. As per DOE Order 435.1, the term refers to any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and to other highly radioactive material that is determined,

consistent with existing law, to require permanent isolation. (Adapted from: Nuclear Waste Policy Act of 1982, as amended.)

Hydraulic spills: Spills that occur when hydraulic fluid leaks from equipment seals or through ruptured hoses.

Investigation-derived waste: Materials that are generated from CERCLA investigations, such as drill cuttings, purge water overburden, interstitial and under burden soils, and wastes (debris, sludge, etc.).

Infectious waste: Waste containing living organisms that could endanger human health or the health of domestic animals or wildlife by extending the range of biological pests, viruses, pathogenic microorganisms, or other agents capable of infesting, infecting, or extensively and permanently altering the normal populations of organisms.

Low-level radioactive waste: Waste that cannot be defined as high-level radioactive waste, spent nuclear fuel, transuranic (TRU) waste, by-product material (as defined in Section 11e. (2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material (DOE Order 435.1).

Mixed waste: Waste containing both radioactive components as defined by the Atomic Energy Act of 1954 (as amended), and hazardous components as defined by 40 CFR 262.

Purge/development water: Water generated from well development or during sampling that is removed from a well before samples are collected.

Radioactive waste: Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954 (as amended) which is of negligible economic value considering costs of recovery.

Sample containers. Vessels composed of steel, aluminum, Teflon, brass, glass, or plastic used to contain samples of water, soil, or other media. Once used, these containers become a waste stream if they cannot be decontaminated for reuse.

Secondary waste: A generic category of wastes that are generated from support activities (including operation and maintenance [O&M] activities) related to retrieving, processing, and packaging the investigation-derived materials. Examples of secondary wastes include waste associated with routine decontamination activities (excluding facility closure), PPE, administrative area and support services wastes, used equipment and filters, and other similar wastes generated during O&M activities.

Special case waste: Waste with TRU constituents exceeding 10nCi/g, polychlorinated biphenyl (PCB) waste, and other waste not routinely expected to be processed through the Storage, Staging, Sizing, and Treatment Facility (SSSTF). Special case waste may include waste that will be classified as TRU waste following analysis.

Spent nuclear fuel: Fuel that has been withdrawn from a nuclear reactor following irradiation and that has not yet been reprocessed to remove its constituent elements.

Toxic Substances Control Act (TSCA) waste: Waste managed strictly under TSCA regulations. At this time, only PCBs and asbestos are regulated under TSCA as waste.

Transuranic waste: Per DOE Order 435.1, radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater

than 20 years, except for (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. (Source: WIPP Land Withdrawal Act of 1992, as amended.)

Unused and unaltered sample material: Material that may include excess soil cores from the interbeds, underlying basalt, and groundwater.

Waste Acceptance Criteria for ICDF Evaporation Pond (Title I)

1. INTRODUCTION

The U.S. Department of Energy Idaho Operations Office (DOE-ID) authorized a remedial design/remedial action (RD/RA) for the Idaho Nuclear Technology and Engineering Center (INTEC) in accordance with the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13 Record of Decision (ROD)[1] (DOE-ID 1999).

The OU 3-13 ROD requires Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation wastes generated within the INTEC boundaries to be removed and disposed of onsite in the Idaho National Engineering and Environmental Laboratory (INEEL) CERCLA Disposal Facility (ICDF). The ICDF, which will be located south of INTEC and adjacent to the existing percolation ponds, will be an on-Site, engineered facility, meeting DOE Order 435.1, Resource Conservation and Recovery Act (RCRA) Subtitle C, Idaho Hazardous Waste Management Act (HWMA), and Toxic Substance Control Act (TSCA) polychlorinated biphenyl (PCB) landfill design and construction requirements. The ICDF will include the necessary subsystems and support facilities to provide a complete waste disposal system.

Only low-level, mixed low-level, hazardous, and limited quantities of TSCA wastes (less than 500 parts per million [ppm] PCBs) will be treated and/or disposed of at the ICDF. Current projections of INEEL-wide CERCLA waste volumes total about 510,000 yd^3. Most of the waste will be contaminated soil, but debris and investigation-derived waste (IDW) will also be included in the waste inventory.

The major components of the ICDF Complex are the disposal cells (landfill), an evaporation pond, and the Staging, Storage, Sizing, and Treatment Facility (SSSTF). The disposal cells, including a buffer zone, will cover approximately 40 acres, with a disposal capacity of approximately 510,000 yd^3. The SSSTF will be designed to provide centralized receiving, inspection, treatment, and segregation necessary to stage and store incoming CERCLA waste from the INEEL WAG 3 and other INEEL WAG remediation sites prior to disposal in the ICDF landfill unit, ICDF evaporation pond, or shipment offsite. All SSSTF activities shall take place within the WAG 3 area of contamination (AOC) to allow flexibility in managing the consolidation and remediation of wastes without triggering land disposal restrictions (LDRs) and other RCRA requirements, in accordance with the OU 3-13 ROD.

The ICDF evaporation pond will accept ICDF leachate, decontamination water, and water from CERCLA well purging, sampling, and well development, and other CERCLA activities (that meet the ICDF evaporation pond waste acceptance criteria [WAC]) for disposal. The ICDF evaporation pond is designated as a RCRA Corrective Action Management Unit (CAMU) in the OU 3-13 ROD. As a CAMU, the ICDF evaporation pond is designed and constructed to accept leachate from the ICDF landfill. Aqueous waste generated by on-Site CERCLA projects that meets this WAC can also be disposed to the ICDF evaporation pond. Additional clean "make-up" water may be required to maintain a minimum of water in the liner system.

1.1 Purpose and Objectives

The purpose of this WAC Document is to provide the basis for the quantities of radioactive and non-radioactive constituents that may be present in ICDF landfill leachate and other CERCLA-generated aqueous waste for disposal to the ICDF evaporation pond.

The objectives of the ICDF evaporation pond WAC are:

- To ensure that waste placed within the ICDF evaporation pond will not exceed the allowable limits for the protection of the Snake River Plain Aquifer (SRPA) per the OU 3-13 ROD requirements.
- To ensure that the commitments in the OU 3-13 ROD are met and maintained.
- To ensure that the waste received at the ICDF evaporation pond contains only the radionuclides and hazardous constituents that the facility can safely manage.
- To ensure that the concentrations and/or total activities of the waste received at the ICDF evaporation pond are compatible with the ICDF evaporation pond design and operations.
- To ensure that aqueous waste received at the ICDF evaporation pond does not contain materials that will compromise the safety or integrity of the facility under the expected operating conditions.

1.2 Scope

The ICDF evaporation pond is a CAMU designed and designated to accept ICDF landfill leachate, and aqueous wastes generated within the ICDF complex and from CERCLA removal/remedial and investigative activities at the INEEL WAGs. The ICDF leachate will be pumped directly to the ICDF evaporation pond. The pump system will track the volume of waste disposed to the pond.

The ICDF evaporation pond system consists of two 2,200,000-gallon capacity ponds that will contain leachate generated from the ICDF landfill, as well as additional inflows from other sources including direct precipitation, washdown water for trucks and equipment, and purge/development water. The ponds are lined with a RCRA Subtitle C equivalent liner system consisting of the following layers, from top to bottom:

- Two high-density polyethylene (HDPE) Geomembrane Liners, each 60 mils thick
- Geosynthetic clay liner (GCL)
- Geocomposite drainage net leak detection layer
- Secondary 60-mil HDPE geomembrane
- Secondary GCL
- Compacted Subgrade, 12 in. thick.

The upper HDPE geomembrane is a sacrificial liner that provides protection from ultraviolet light and a measure of puncture protection to the upper, primary geomembrane. GCLs are provided as equivalent protection to one layer 3 ft of $1x10^{-7}$ centimeters per second (cm/sec) clay (beneath the secondary geomembrane) to allow the pond to function through temperature extremes at the INEEL. The evaporation ponds are designed for operating periods of 15 years for the active life of the landfill, and 30 years for post-closure.

1.2.1 CAMU Designation and Land Disposal Restrictions

The OU 3-13 ROD designates the ICDF evaporation pond as a CAMU. A CAMU is defined as "*an area within a facility that is used only for managing remediation wastes for implementing corrective action or clean-up at the facility*" (40 CFR 260.10). Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes (40 CFR 264 Subpart S (a)(1)). Appendix A discusses the CAMU rule and the DOE-ID position of the ICDF evaporation pond as a CAMU. The preamble to the CAMU rule states, "*As a result of today's rule, remediation waste placed in CAMUs will not be subject to Land Disposal Restrictions (LDRs) or other hazardous waste disposal requirements.*" (Federal Register, 1993).

1.3 Road Map to the Waste Acceptance Criteria

The following are primary elements of the ICDF evaporation pond waste acceptance requirements:

- Responsibilities (Section 1.5)
- Waste Profile Process (Section 2)
- Criteria basis (Section 4)
- WAC (Section 5)
- Waste content or concentration accepted at the ICDF evaporation pond (Section 5)
- Waste form and container requirements (Section 2.2)
- Exceptions to WAC requirements (case-by-case acceptance) (Section 2.4.4.)
- Prohibitions (Section 5.2)
- Non-conforming waste (Section 3.8).

1.4 Relationship to Other Documents

This ICDF evaporation pond WAC is based on and integrates with several related documents, as discussed below.

1.4.1 OU 3-13 Record of Decision

The OU 3-13 ROD (DOE 1999) is the regulatory authorization for the ICDF Complex. It includes the regulatory basis for the ICDF landfill, and the applicable or relevant and appropriate requirements (ARARs) that the ICDF Complex must meet. The OU 3-13 ROD designates the ICDF evaporation pond as a CAMU that will be designed and constructed to accept the ICDF leachate and other aqueous wastes generated from the operation of the ICDF Complex. Other liquid wastes from CERCLA projects can also be disposed in the evaporation pond.

1.4.2 Related ICDF Complex WACs

Three WACs will be in effect in the ICDF Complex during operation of the landfill. They are briefly described below:

1. **ICDF Landfill WAC**—This WAC specifies the requirements for waste that will be disposed in the ICDF landfill.

2. **SSSTF WAC**—The SSSTF WAC specifies waste acceptance for waste to be treated at the SSSTF, stored at the SSSTF, or packaged for shipment to an off-Site facility. Wastes meeting the SSSTF WAC must also demonstrate that they meet the ICDF landfill WAC in order to be disposed of in the ICDF landfill and the ICDF evaporation pond WAC for disposal in the ICDF evaporation pond.

3. **ICDF Evaporation Pond WAC**—This WAC specifies WAC for waste to be disposed in the ICDF evaporation pond.

Integration between the various WACs will be achieved, by the use of the same waste profile for all facilities.

The following RD documents were developed in support of the ICDF Complex, including the ICDF evaporation pond design and ICDF evaporation pond WAC:

- Leachate Generation Study (DOE-ID 2001a)—The Leachate Generation Study was used to determine how much leachate would be generated during normal landfill operations, and the volume of leachate that would be generated by the 25-year, 24-hour storm event. This includes a water balance to determine the amount of leachate expected to be generated based on precipitation, moisture content of incoming waste, water added for dust control and compaction, and evaporation.

- Leachate/Contaminant Reduction Time Study (DOE-ID 2001b)—The Leachate/Contaminant Reduction Time Study calculated the amount of radionuclides expected in the leachate based on the waste inventory and the geochemistry of the waste and water.

- Fate and Transport Modeling Results Summary Report (DOE-ID 2001c)—The Fate and Transport Modeling Study determined the impact of the ICDF and the ICDF evaporation pond on the SRPA.

- Liner/Leachate Compatibility Study (DOE-ID 2001d)—The Liner/Leachate Compatibility Study was performed to determine the compatibility study of materials proposed for the ICDF landfill liner system and expected waste leachate. The study concluded that the manufacturer-recommended limits associated with the HDPE geomembrane liners were several orders of magnitude higher than the estimated maximum ICDF landfill leachate concentrations. A GSE® 60-mm HDPE geomembrane liner has been specified for the ICDF evaporation pond. Because the liner is acceptable for the landfill, it will also meet the requirements of the ICDF evaporation pond. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity were established. The study did not show any threat to the liner from radionuclides present in the waste to be managed at the ICDF landfill.

- Evaporation Pond Sizing and Water Balance Calculations (DOE-ID 2001e)—These calculations determined the size and depth of the evaporation pond based on leachate generation, precipitation, effluent from the SSSTF treatment processes, purge/development water from CERCLA groundwater monitoring wells, and evaporative potential.

1.5 Responsibilities

1.5.1 Evaporation Pond Management and Operations Team

ICDF Complex management will be responsible for performing activities related to the ICDF evaporation pond in accordance with the ICDF evaporation pond WAC and other WAC documents for the ICDF landfill and the SSSTF. A system of checks and balances will be in place to ensure the appropriate level of coordination exists among those operating and using the ICDF complex. This system of checks and balances will protect the ICDF evaporation pond from being out of compliance with applicable regulations. A general description of the system as it relates to the ICDF evaporation pond is presented below. As design and operating parameters are further detailed, this description will be further defined.

The ICDF evaporation pond management and operations team will include the selected organizations assigned to operate the ICDF complex. These personnel will be responsible for:

- Maintaining the WAC document for the ICDF evaporation pond
- Review and approval/rejection of requests for disposal of aqueous wastes based on health and safety, the waste acceptance documents, and current environmental regulations
- Maintaining a proactive quality assurance (QA) program for timely identification of deficiencies and implementation of appropriate corrective actions, including verification procedures to ensure that incoming wastes meet the ICDF evaporation pond WAC
- Conducting periodic inspections of the pond
- Leak detection monitoring.

1.5.2 Evaporation Pond Users (DOE-ID and Subcontractors)

The ICDF Complex users must specify and obtain approval from the ICDF Complex management prior to shipment. Aqueous wastes that can be accepted at the ICDF evaporation pond include:

- ICDF landfill leachate
- Aqueous wastes generated in the ICDF complex and from CERCLA investigative, remedial, and removal activities at the INEEL WAGs
- Secondary aqueous wastes from waste processing and decontamination activities in the SSSTF and INEEL WAGs
- Purge and development water from CERCLA monitoring wells.

The users of the ICDF evaporation pond will be required to:

- Participate in planning discussions and submit long-term operational project schedules that involve ICDF evaporation pond usage
- Develop, document, and implement appropriate waste sampling and analysis plans when required for development of waste profiles (see Appendix B)

- Prepare aqueous waste profiles, designate the aqueous waste, and obtain ICDF evaporation pond management acceptance for each aqueous waste source or group of aqueous waste sources, for aqueous waste that will be disposed of in the ICDF evaporation pond

- For waste not in the design basis, compare the new waste with the WAC for the ICDF evaporation pond, and determine if the new waste is within the acceptable limits

- Obtain and/or confirm ICDF evaporation pond management's authorization for disposal of the aqueous waste in the ICDF evaporation pond

- Transport approved aqueous wastes to the SSSTF.

2. WASTE PROFILE PROCESS

2.1 General Requirements

The generator must fill out a waste profile for waste to be generated and then obtain ICDF Complex Operations approval before shipping the waste to the ICDF Complex for disposal. Table 2-2 summarizes the types of waste that are accepted at the ICDF evaporation pond. At a minimum, a waste proposed for disposal at the ICDF will undergo analysis for radionuclides, metals, cations, anions, and organics, as necessary. If process knowledge is used, appropriate documentation shall be provided with the waste profile.

Both direct and indirect methods are used to characterize waste. Selection of the method depends on the parameters being measured, hazards associated with acquiring the information, and the amount and quality of data needed. When capable of yielding sufficient information, indirect methods are preferred for obtaining the characterization data, as is consistent with ALARA requirements. Acceptable knowledge can be effective when waste behavior is well known and highly controlled for a predictable product.

2.2 General Class of Waste

The ICDF manages low-level and mixed waste. This generally excludes acceptance of waste classified as high-level waste, spent nuclear fuel, and/or byproduct material.

Table 2-1. Summary of acceptable types of wastes for the ICDF evaporation pond WAC.

Waste Type Accepted at the ICDF	Content Accepted
ICDF leachate (F039 waste)	All ICDF leachate is acceptable.
INEEL CERCLA-generated liquid Hazardous Waste (other than ICDF leachate)	Listed or characteristic CERCLA-generated hazardous waste can be accepted at the ICDF evaporation pond if it meets the concentration criteria. LDRs do not apply, because the ICDF evaporation pond is a CAMU.
Radioactive Waste	Both a radiation count and speciation are required for radioactive waste.
Secondary Aqueous Waste	Secondary waste must meet the applicable hazardous and radioactive ICDF evaporation pond WAC.
Mixed Waste	Mixed waste must meet both the hazardous and radioactive ICDF evaporation pond WAC.
Well purge/development water	Well purge/development water will be accepted at the ICDF evaporation pond if they meet the WAC.

Each of the wastes listed in Table 2-1 is further described in a subsequent section, and guidelines for the waste profile (see Appendix B) appear in Section 3-4.

2.3 Composition and Waste Containers

For all waste, a detailed record must be kept of the contents and volume of waste disposed to the ICDF evaporation pond. Waste containers may be used to transport liquid wastes to the ICDF

evaporation pond, but the containers themselves will not be disposed in the ICDF evaporation pond. Waste containers must be capable of being discharged to the pond via pumping at the pump station.

2.4 Physical and Chemical Characterization

The waste generator must determine the physical and chemical characteristics of the waste with sufficient accuracy and detail to properly designate and manage the waste in accordance with the unit-specific acceptance criteria and all applicable regulations (i.e., acceptable knowledge). The following sections describe the physical/chemical characterization requirements for waste acceptance (40 CFR 264.13, 40 CFR 761).

2.4.1 Type of Acceptable Knowledge

Types of information that can be used for physical/chemical characterization include data from analysis of the waste and knowledge of the materials and/or processes used to generate the waste. Acceptable knowledge requirements can be met using one or more of the following:

- Analytical results from previous sampling of the same well
- Analytical data on the waste or a waste from a similar process
- Qualified analytical data.

If the information is sufficient to quantify constituents and characteristics, as required by the regulations and unit-specific acceptance criteria, the information is considered acceptable knowledge.

2.4.2 General Knowledge Requirements

When a waste designation is based solely on process knowledge, the generator must ensure that the chemical, physical, and radiological properties of the waste are adequately determined. The designation must be accomplished with sufficient accuracy to ensure that subsequent treatment, storage, or disposal of the waste will ensure protection of human health and the environment. The logic used to make the designation must be documented. The technical basis, including documented historical information, procedures, practices, and information gained from interviews, shall be documented.

The minimum level of acceptable knowledge must include designation data where the constituents causing a listed waste code to be assigned are quantified, and data that address acceptance criteria necessary for proper management of the waste.

Analytical data and/or knowledge of the waste must be sufficient to determine whether the waste is regulated under 40 CFR 261 or 760, and to assign correct hazardous waste codes (where applicable). Where the available information does not qualify as acceptable knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods outlined in the ICDF Waste Management Plan (WMP) must be used to determine whether a waste will be designated as toxic characteristic, corrosive.

In cases where constituents that could cause a waste to be listed are present in a process, but are not expected to be in the waste in concentrations causing the waste to be above LDRs, sampling and analysis must be performed to demonstrate that the constituents are below regulated limits. This requirement can be met through previous (RI/FS or other CERCLA) investigations. This sampling and analysis is required only for initial characterization of the waste stream.

Listed waste may be designated based on process knowledge. Other waste stream designations may be based on process knowledge and/or analytical data. The generating environmental restoration (ER) CERCLA project will conduct a reasonable review to determine whether a listed waste source is present at the remediation waste site. The listed waste review generally will rely on readily available documents gathered as a part of the standard CERCLA site evaluation or RI/FS. For CERCLA OUs where listed waste sources are reasonably expected, standard operator interviews should be augmented and documented as necessary to ask questions specifically aimed at identification of potential sources. Operator interviews will not be used as the sole basis for an affirmative listed waste determination in the absence of confirmatory documentation or physical evidence.

2.4.3 Land Disposal Restriction Knowledge

Because the ICDF evaporation pond is a CAMU, LDRs do not apply to waste disposed to the ICDF evaporation pond.

2.4.4 Exceptions to Physical and Chemical Characterization Requirements

The following exceptions, with agency concurrence, can be made to the physical/chemical characterization requirements stated previously:

Waste that cannot be characterized in accordance with the requirements stated previously because of factors such as unique chemical or radiological hazards of the waste can be characterized by an alternative management path negotiated with the ICDF Complex management. This waste is normally generated during INEEL CERCLA field investigations awaiting analysis or other pending documentation requirements. It may include indigenous wastes (i.e., purge and development water) and non-indigenous waste (e.g., samples altered during analysis, and other waste materials generated from collecting and analyzing samples or drilling and installing wells, borings, and test pits). The ICDF Complex management must be contacted to determine acceptability prior to shipment to the ICDF Complex.

2.5 Radiological Characterization

The major radionuclides in the waste and the concentration of each major radionuclide must be established with sufficient sensitivity and accuracy to properly classify and manage the waste in accordance with the radiological limits.

2.5.1 Identification of Major Radionuclides

For the purposes of the radiological criteria in this document, major radionuclides are defined as those radionuclides that meet any of the following conditions. Calculation methods for determining these limits are described in Appendix C.

- Any TRU radionuclide present in the waste in concentration exceeding 1,000 picocuries per liter
- Any fissionable radionuclide present in the waste in a quantity exceeding 0.1 fissile gram equivalent (FGE) per container
- Any radionuclide that accounts for more than 1% of the total radiological activity of the waste

- Any radionuclide present in concentration exceeding 1% of its respective Category 1 limit (Appendix C, Table C-2)

- Any mobile radionuclide present in concentration that exceeds its reporting limits (Appendix C, Table C-2)

- For waste that cannot be radiologically released, an estimate of radiological constituents will be included in the waste profile for tracking purposes.

2.5.2 Acceptable Knowledge and Methods for Establishing Radionuclide Inventories

The radionuclide inventory of a waste must be established using a method or combination of methods capable of identifying and quantifying the major radionuclides present. The methods chosen must provide adequate sensitivity and accuracy to ensure that the waste meets the criteria. A graded approach should be applied when planning radiological characterization. Using the graded approach, more frequent and detailed analysis and a higher level of statistical confidence are applied when the concentration of radionuclides is performed when a waste approaches one or more of the limits of the criteria. Conversely, waste that is far below applicable limits of the criteria would not require as extensive or frequent an analysis. An approved methodology should help ensure that the appropriate type, quantity, and quality of radiological characterization data are obtained.

Both direct and indirect methods can be used for characterization. Indirect methods (i.e., methods other than direct measurement of a given radionuclide) are acceptable. The following characterization methods can be used individually or in combination to establish the radionuclide inventory of the waste.

Process knowledge includes documented knowledge of the radioactive materials used and the processes that contributed to the radiological content of the waste, along with historical analysis of waste and radiological contamination from the process. Process knowledge can be used to establish the suspected major radionuclides in a waste stream. In addition, process knowledge can be used to eliminate from further consideration those radionuclides not present in sufficient concentration to be major radionuclides as defined in Section 2.5.1, as long as the basis of this determination is documented. Process knowledge alone generally may not be sufficient to quantify the radionuclide inventory of a waste. Process knowledge can be used to develop the analyte list.

Direct measurement field and laboratory analysis methods, such as radiochemical analysis, and surveys with field instruments, must be selected as appropriate to detect and quantify the major radionuclides with adequate sensitivity and accuracy for waste classification. Analysis methods that measure gross activity (i.e., not radionuclide-specific) may be used in conjunction with other methods to determine the relative concentration (scaling factors) of each suspected radionuclide, and may be corroborated periodically with radionuclide-specific analysis.

Computer modeling, applied appropriately, could be used in conjunction with other methods for radiological characterization. The modeling must be performed by an individual who is knowledgeable and experienced in the use and limitations of the model. The assumptions and measurements used as inputs to computer modeling must be documented. The computer software must be controlled in a manner that meets conventional QA requirements. Computer models must be corroborated periodically with direct measurement methods.

Scaling factors can be used to relate the concentration of a readily measured radionuclide to more difficult to measure radionuclides. Scaling factors must be developed from one of the previous methods, and must be corroborated periodically with radionuclide-specific analysis. Other methods of radiological

characterization could be used, but must be clearly documented and approved by the ICDF Complex management. Documentation of the method must include a detailed description of the method, the radionuclides identifiable by the method, and a discussion of precision, accuracy, quality assurance, and quality control methods.

2.5.3 Additional Detail on Mobile Radionuclide Characterization

For low-level waste and low-level mixed waste, mobile radionuclide reporting is necessary for compliance with the ICDF complex performance assessments. Because of the low reporting limits and difficulty of analysis of certain mobile radionuclides, this section provides additional detail concerning acceptable knowledge and characterization.

The concentration of each mobile radionuclide must be established with respect to the Appendix C, Table C-2, reporting limit using process knowledge and/or analysis. If process knowledge alone is used to determine that a mobile radionuclide is not present in a waste stream at the reporting limit, the basis for this determination must be clearly documented. If available analysis techniques cannot detect a mobile radionuclide at its reporting limit, the concentration could be estimated using a combination of process knowledge, scaling factors, and analytical detection limits. Mobile radionuclide reporting is intended to measure only the quantity of isotopes that exceeds INEEL Site natural background concentrations. For waste forms that contain a mobile radionuclide (uranium) that originates from natural background on the INEEL Site, the background concentration of that radionuclide can be subtracted from the total concentration.

3. WASTE ACCEPTANCE PROCESS

3.1 Planning

3.1.1 Waste Streams and Volumes

The aqueous wastes that will be generated at the ICDF and the INEEL WAGs are as follows:

- **ICDF landfill leachate.** The design and operation of the ICDF landfill will include provisions for leachate monitoring and management. The leachate will be disposed of in the ICDF evaporation pond with no treatment. The quantity of leachate will vary with the rate of precipitation and the uncovered surface area of the ICDF landfill.

- **Aqueous wastes generated in the ICDF complex and from CERCLA investigative, remedial, and removal activities at the INEEL WAGs.** The aqueous wastes generated inside the ICDF will be capable of being sent to the ICDF evaporation pond directly, as long as the radionuclide and non-radionuclide constituent content can be determined. The aqueous wastes generated outside the ICDF will be sampled and a waste profile completed by the waste generator prior to the waste being shipped to the ICDF Complex for disposal in the ICDF evaporation pond. All of the waste in the current design basis inventory can be accepted into the ICDF evaporation pond without treatment.

- **Secondary aqueous wastes from waste processing and decontamination activities inside the SSSTF and ICDF Complex.** The quantity of aqueous waste generated from decontamination activities is expected to be minimal. All secondary aqueous wastes generated by decontamination activities will be capable of being disposed of in the ICDF evaporation pond without treatment.

- **Purge and development water from monitoring wells.** It is estimated that approximately 263,000 gallons of monitoring well purge and development water will be generated prior to the middle of the year 2003 when the ICDF evaporation pond is expected to become operational. This water will be stored in tanks at the SSA until the ICDF evaporation pond is ready to accept it. After the ICDF evaporation pond becomes operational, the peak purge and development water generation rate is estimated to be 35,000 gal/year. The purge water generated prior to the opening of the ICDF evaporation pond will be sampled, analyzed, and profiled prior to disposal. The projected inventory of purge and development water can be accepted into the ICDF evaporation pond without treatment. Additional clean "make-up" water may be required to maintain a minimum water level in the liner system.

3.1.2 Long-Term Scheduling

As mentioned in Section 1.5.2, the ICDF evaporation pond users will be tasked with participating in planning discussions and submitting long-term operational project schedules. The ICDF evaporation pond is designated to receive leachate generated during long-term ICDF operations.

3.1.3 Operational Scheduling

The management and operational team of the ICDF evaporation pond will perform operational scheduling. The scheduling of wastes for disposal to the pond will be performed based on a prioritization of wastes for disposal and upon keeping the liquid level in the pond within the design requirements.

Since trucks delivering aqueous wastes to the ICDF evaporation pond will be logged in through the SSSTF, scheduling of the truck-delivered aqueous waste receipts will need to be coordinated with the non-aqueous waste receipts into the SSSTF.

3.2 Waste Tracking System

The waste profile in Appendix B is an example of the information required for the waste tracking system. This exact format will be replaced with input into the electronic data system once the system has been revised to incorporate the CERCLA facility. "Sample Copy" was placed in the background of the profile sheets so that it is clear that this sheet will be replaced. Data System information will be included in the 90% Design.

3.3 Data Quality Objectives

The Data Quality Objectives (DQOs) process, or a comparable process, will be used to identify characterization parameters and acceptable uncertainty in characterization data. The intent is not to re-characterize using DQO-identified waste streams, but to ensure that new waste streams are identified and generated, and/or that existing streams are significantly modified. DQOs can be used as supporting documentation from the waste generators when they are providing information to meet the WAC.

3.4 Waste Profile

ICDF Leachate: The ICDF leachate will be discharged directly to the ICDF evaporation pond. The ICDF management and operating personnel will be responsible for preparing waste profile sheets for the leachate. The leachate is characterized as F039 waste, and the CAMU is designed and constructed to accept this waste. The leachate management system will record volumes of leachate pumped to the ICDF evaporation pond. The ICDF management may track the concentrations of key indicator parameters contained in the leachate, as measured in the evaporation pond, over time.

ICDF Complex aqueous wastes (non-leachate): The ICDF management and operating personnel will be responsible for preparing the waste profiles and designating the wastes that are generated inside the ICDF Complex, Individual discharges of aqueous waste to the ICDF evaporation pond must be accompanied by a waste profile sheet, but separate analytical data are not required for each discharge of water from the same source (e.g., decontamination water) because the waste generating the water is the same as the waste generating the ICDF leachate. However, the volumes from non-leachate sources need to be tracked and recorded.

Non-ICDF Complex wastes: The generating WAGs or projects must complete a waste profile for wastes to be stored at the ICDF Complex. The initial aqueous waste stored at the SSA will have analytical data available before the ICDF evaporation pond is operational. Subsequent aqueous waste from the same sources (purge water from the same wells, for example) will be accepted with a new waste profile that can be prepared on the basis of the initial waste profile. Aqueous waste from new waste sources must be accompanied by a waste profile with analytical data or sufficient process knowledge to show that the waste meets the ICDF evaporation pond WAC.

3.4.1 Waste Profile Reevaluation Process

The ICDF Complex manager or designee will reevaluate a waste profile under the following conditions:

- The process generating the waste has changed.
- Inspection or analysis indicates that the waste received at the ICDF Complex does not match the waste identified on the accompanying pre-acceptance documentation or is not compliant with this WMP.

When a profile is re-evaluated, the generator may request to do one or more of the following:

- Verify that the current waste profile is accurate
- Supply a new waste profile
- Look for alternative disposal
- Submit a sample for parameter analysis.

3.4.2 ICDF/ ICDF Evaporation Pond Special Case Waste Types

Special case waste will be accepted for temporary storage at the SSSTF until final disposal is determined. This may include disposal at the evaporation pond or to a disposal facility off-site. Potential for disposal at the evaporation pond is determined by this WAC.

3.5 Waste Certification Process

Waste certification is a combination of waste designation, characterization, and verification that records of quantities of radioactive and non-radioactive constituents disposed of in the ICDF evaporation pond are maintained.

3.5.1 Waste Certification Form

The certification program ensures generator responsibility and accountability of the waste being sent to the ICDF for disposal. An example of the waste certification form, shown in Appendix B, is attached to the waste profile after the waste is shipped to the SSSTF. The waste certification form must be signed by the ICDF Complex manager or designee, certifying that the waste meets appropriate requirements. The waste certification form will be recorded and maintained in accordance with DOE-ID policy and applicable ARARs.

3.5.2 Recertification

The ICDF manager or designee will reevaluate a waste profile under the following conditions:

- The process generating the waste has changed.
- Inspection or analysis indicates that the waste received at the ICDF Complex does not match the waste identified on the accompanying pre-acceptance documentation or is not compliant with this WAC.

When a profile is reevaluated, the generator may be requested to do one or more of the following:

- Verify that the current waste profile is accurate

- Submit additional data
- Correct any errors
- Provide required information which may include analytical data
- Supply a new waste profile.

3.6 Verification as Packaged

The package verification process is to ensure that the waste is packaged in waste profile-approved containers prior to shipment.

3.7 Receipt Verification

Waste receipt verification will be performed by the ICDF Complex operations at the SSSTF. Receipt verification will be performed by a combination of inspection of the incoming shipment with cross-checking the incoming waste against the waste profile in the electronic database and profile number for items such as number, types, and labeling of containers (where applicable). Receipt verification is described in detail in the SSSTF WAC (to be provided in the SSSTF 90% Design Document).

3.8 Non-Conforming Waste

Non-conforming waste is aqueous waste that cannot be disposed of in the ICDF evaporation pond. Non-compliant waste is not expected to be generated at the ICDF and INEEL WAGs. Because the ICDF evaporation pond is a CAMU, the only non-compliant wastes would be those with excessive radiological concentrations, concentrations of organics higher than those in the Liner/Leachate Compatibility Study, or concentrations of volatile organics over 500 parts per million (ppm).

3.9 Records

All records will be kept on file at the ICDF Complex indefinitely per DOE-ID letter dated November 26, 1991, signed by C.J. Webb. The records and documents that will be kept and maintained include:

- Waste profiles and any accompanying forms (i.e., analytical results)
- Chain-of-custody forms
- Inspection records
- Audit, surveillance, and observations of generator's waste characterization activities
- Training records
- Any other applicable documentation.

3.10 Shipping

The waste generating organization is required to prearrange the delivery time and date of all waste shipped to the ICDF evaporation pond, and ensure that a chain-of-custody form accompanies all wastes brought to the ICDF evaporation pond. These arrangements can be made during the initial contact, if the waste has been accepted for receipt. A shipment sent without prior arrangement may be rejected.

3.10.1 Transportation and Packaging

Packaging of CERCLA-generated waste shall be in compliance with the OU 3-13 ROD ARARs. Container specifications are listed in Table 3-1.

Table 3-1. Container specification.

Waste Type	Tanker Truck or Trailer Tank	35-Gallon Barrel or 55-Gallon Drum	Crosslinkable Polyethylene Tanks	
			VCT	VOT
Hazardous	X[a]	X	N/A[b]	N/A
RAD	X	X	N/A	N/A
RAD and Mixed RAD	X	X	N/A	N/A
Case-by-Case	X	X	N/A	N/A

a. X = applicable

b. NA = not applicable

NOTE: Other types of containers may be used if they have received approval prior to shipment.

3.10.2 Shipping Documentation

All waste transported on public roadways (between TAN and the ICDF Complex between RWMC and the ICDF Complex) shall be shipped in compliance with applicable U.S. Department of Transportation (DOT) regulations. When applicable, a February 12, 1997, Federal Register (62 FR 6622) rule change allows non-manifested waste as follows:

The manifesting requirements in 40 CFR Part 262, Subpart B and the pre-transport marking requirements in Section 262.32(b) do not apply to the transport of hazardous waste along the border of contiguous property, under the control of the same person, even if such contiguous property is divided by a public or private right-of-way [Section 262.20(f)]. Further details will be included in the SSSTF WAC, (to be provided in the SSSTF 90% Design Document).

3.10.3 Authorization to Ship

The CERCLA project generating the waste must receive authorization from the ICDF Complex management to ship waste. The waste generating organization is required to prearrange the delivery time and date of all waste shipped to the ICDF Complex for disposal at the ICDF and ensure that a waste profile and chain-of-custody forms accompany all wastes brought to the ICDF Complex. A shipment sent without prior arrangement may be rejected. A detailed procedure can be found in the SSSTF WAC (to be provided in the SSSTF 90% Design Document).

3.11 Waste Delivery

3.11.1 ICDF Leachate

The ICDF leachate will be pumped to the ICDF evaporation pond from the leachate collection sump.

3.11.2 Other Wastes

The monitoring well purge and development water will be delivered in tanker trucks, 55-gal drums, or pumped directly to the pond from trucks, tanks, trailer tanks, or drums. The decontamination water will be collected in a lift station and pumped to the ICDF evaporation pond by pressure pipeline. As an option, tanker trucks could be used to transfer the decontamination wastewater to the ICDF evaporation pond.

4. WASTE ACCEPTANCE BASIS

4.1 Criteria Basis

The basis for acceptance criteria includes protection of human health (including worker health and safety), compliance with ARARs per the OU 3-13 ROD to protect human health and the environment, compliance with applicable DOE orders, and best management practices.

4.1.1 Remedial Design Analysis

The WAC is based on the Design Basis Inventory (DOE-ID 2001f) and the results of the studies summarized in Table 4-1.

Table 4-1. Summary of ICDF study results influencing the ICDF WAC.

Document	Summary of results
Leachate Generation Study (DOE-ID 2001a)	This study determined how much leachate would be generated during normal landfill operations, and the volume of leachate that would be generated by the 25-year, 24-hour storm event. This includes a water balance to determine the amount of leachate expected to be generated based on precipitation, moisture content of incoming waste, water added for dust control and compaction, and evaporation.
Leachate/Contaminant Reduction Time Study (DOE-ID 2001b)	This study provides the content of a hypothetical ICDF leachate based on the Design Basis Inventory (DOE-ID 2001f). It provides the modeled composition of the leachate during the operations period, taking into account solubility, soil-water partitioning, and radioactive decay, using a combination of K_d s and geochemistry modeling. An operational period of 15 years was assumed for the ICDF landfill.
Fate and Transport Modeling Results Summary Report (DOE-ID 2001c)	This study estimated contaminant fate and transport (100,000 year simulations) through the vadose zone to a hypothetical monitoring well located 20 meters (m) downgradient of the ICDF in the Snake River Plain Aquifer (SRPA).
Waste-Soil Design Ratio Calculations (DOE-ID 2001d)	These calculations were performed for various types of solid debris varying from rubble to cement monoliths. The soil/waste radio depends on the size and the shape of the non-soil waste and varies from 2:1 to 19:1.
Hydrologic Modeling of Final Cover (DOE-ID 2001g)	The model was used to evaluate long-term infiltration rates through the landfill cover section for the ICDF. The climatic parameters were actual data from the 10 years most representative of the average (50th percentile) and years with greater than the 90th percentile of recorded annual precipitation.
Evaporation Pond Sizing and Water Balance Calculations (DOE-ID 2001e)	These calculations determined the size and depth of the evaporation pond based on leachate generation, precipitation, effluent from the SSSTF treatment processes, purge/development water from CERCLA groundwater monitoring wells, and evaporative potential.

Table 4-1. (continued).

Liner/Leachate Compatibility Study (DOE-ID 2001d)	This study indicates that the main chemical threat to the ICDF would be organic constituents. Organic constituents would have to be present at concentrations several orders of magnitude higher than the Design Basis Inventory organic constituents before they could be considered a problem for liner computability. A GSE® 60-mm HDPE geomembrane liner has been specified for the ICDF evaporation pond. Because the liner is acceptable for the landfill, it will also meet the requirements of the ICDF evaporation pond. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity were established. The study did not show any threat to the liner from radionuclides present in the waste to be managed at the ICDF landfill.

4.1.2 Protection of Human Health and the Environment

Occupational exposure for radiological and chemical contaminants will be maintained as low as reasonably achievable (ALARA). During the operational phase, operating procedures developed for the ICDF evaporation pond will be followed. The operational procedures will protect the environment by complying with environmental regulations called out in the OU 3-13 ROD as ARARs.

4.1.3 Protection of the ICDF Evaporation Pond Liner System

A compatibility study of materials proposed for the ICDF evaporation pond landfill liner system and expected waste leachate was performed as part of the Evaluation of Liner/Leachate Chemical Compatibility for the ICDF. The study concluded that the manufacturer-recommended limits associated with the high-density geomembrane liners were several orders of magnitude higher than the estimated maximum ICDF evaporation pond landfill leachate concentrations. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity were established. The study did not show any threat to the ICDF evaporation pond liner from radionuclides present in the waste to be managed at the ICDF landfill. Waste with constituents in sufficient concentration that could result in loss of ICDF evaporation pond liner integrity shall not be accepted.

The ICDF Complex management shall evaluate waste with chemical constituents not listed in this document on a case-by-case basis. The evaluation shall consist of a paper study showing that the new waste constituents are chemically equivalent to an approved constituent. If chemical equivalency cannot be determined through a paper study, EPA Method 9090 may be required to show that the aqueous waste is compatible with the liner material.

4.1.4 Compliance with ARARs

The pond will be designed and operated in compliance with the ARARs. The majority of ARARs fall into broad categories that relate to design and operation, release detection, and monitoring. For example, the regulations in 40 CFR Subpart K, 264.221 *Surface Impoundment Design and Operating Requirements* will be used as a basis for design requirements for the ICDF evaporation pond. ARARs that affect the WAC are those that limit what types of waste and what concentrations/activities of contaminants are allowed to enter the pond. These ARARs are discussed below.

4.1.4.1 The Corrective Action Management Unit. The CAMU rule (40 CFR 264.552) has the most effect on the WAC. The ICDF evaporation pond is designated as a CAMU unit in the OU 3-13

ROD. CAMU "means an area within a facility that is used only for managing remediation wastes for implementing corrective action or cleanup at the facility." For purposes of this WAC, the INEEL is considered "the facility." Subpart S of 40 CFR 264 specifically provides for Corrective Action for Solid Waste Management Units or CAMU in 40 CFR 264.552(a):

> To implement remedies under 264.101 or RCRA 3008 (h) or to implement remedies at a permitted facility that is not subject to 264.101, the Regional Administrator may designate an area at the facility as a corrective action management unit, as defined in 260.10, under the requirements in this section. A CAMU must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the CAMU originated. One or more CAMUs may be designated at a facility.
>
> (1) Placement of remediation waste into or within a CAMU does not constitute land disposal of hazardous wastes.
>
> (2) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.

4.1.4.2 IDAPA 58.01.05.008 (40 CFR 264.221[c][2]). These standards give specific requirements for a leachate collection and removal system below the impoundment, including 264.221. (c)(2)(iii) "Constructed of materials that are chemically resistant to the waste managed in the surface impoundment and the leachate expected to be generated . . ."

***4.1.4.3 IDAPA 58.01.05.008 (40 CFR 264, Subpart BB)* Air Emissions Standards for Equipment Leaks.** These standards apply to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10% by weight. The standards are for specific pieces of equipment (e.g., pumps, compressors, and pressure relief valves).

4.1.4.4 IDAPA 58.01.05.008 (40 CFR 264, Subpart CC) Air Emission Standards for Tanks, Surface Impoundments, and Containers. The standard 40 CFR 264.1082(c)(1) provides:

> (1) A tank, surface impoundment, or container for which all hazardous waste entering the unit has an average volatile organic (VO) concentration at the point of waste origination of less than 500 ppm by weight. The average VO concentration shall be determined using the procedures in 264.1083 (a) of this subpart. The owner or operator shall review and update, as necessary, this determination at least once every 12 months following the date of the initial determination for the hazardous waste streams entering the unit.

Also, the entire Subpart CC Air Emission Standards for Tanks, Surface Impoundments, and Containers (IDAPA 58.01.05.008 [40 CFR 264.1080 through 1090]) has a specific exemption for remedial actions under CERCLA:

- "40 CFR 264.1080 (b) The requirements of this subpart do not apply to the following waste management units at the facility: (5) A waste management unit that is sole for on-site treatment or storage of hazardous waste that is placed in the unit as a result of implementing remedial activities required under the corrective action authorities of RCRA sections 3004 (u), 3004 (v), or 30008 (h); CERCLA authorities; or similar Federal or State Authorities."

- 40 CFR 61.92 *National Emission Standards for Hazardous Air Pollutants (NESHAPs) for radionuclides from DOE.* This regulation states "Emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mRem/yr."

- 40 CFR 61.93 *Facilities, Emission Monitoring and Emission Compliance.* This regulation specifies how compliance with 40 CFR 61.92 is demonstrated.

5. ACCEPTANCE CRITERIA FOR THE ICDF EVAPORATION POND

5.1 Prohibited Waste

The materials prohibited from disposal at the ICDF evaporation pond are described in this section.

5.1.1 TRU Constituent Waste>10 nCi/g

Waste containing greater than 10 microcuries per liter of TRU radionuclides is prohibited from disposal at the ICDF evaporation ponds.

5.1.2 TSCA Waste

TSCA waste is prohibited from disposal at the ICDF evaporation pond.

5.1.3 Other Prohibited Wastes

Other wastes prohibited from disposal at the ICDF evaporation pond are listed below:

1. Waste capable of detonation, explosive decomposition, or reaction at normal pressures and temperature, or explosive reaction with water (DOE Manual 435.1, IV G (d) (3)). This includes unreacted alkali metal (e.g., sodium). Chemicals that react with atmospheric oxygen to form shock-sensitive organic peroxides are prohibited at concentrations that are capable of generating an explosive reaction.

2. Waste capable of generating toxic gases, vapors, or fumes harmful to persons transporting, handling, and disposing the waste (Manual 435.1 IV G (d) (4)).

3. TRU waste, as defined in DOE Manual 435.1, Chapter IIIA.

4. Hazardous waste with greater than 500 ppm organic/carbonaceous compounds.

5. Waste exceeding the Class C limit, as defined in 10 CFR 61.55.

6. Waste containing greater than 1% chelating compounds by weight.

7. Spent nuclear fuel and high-level waste (DOE Manual Chapter II A).

Table 5-1. Materials restricted from disposal at the ICDF evaporation pond until the listed conditions have been met.

Restricted Material	Condition to be Met
Refrigerant-bearing equipment containing chlorofluorocarbons (CFCs)	CFC removal has been completed (40 CFR 82)
Pyrophoric waste	Must be treated, to be nonflammable prior to being disposed
Liquid acid waste that exhibits the characteristic of low pH under the corrosivity tests of 40 CFR 261.22	Must be neutralized
Infectious waste, as defined in 10 CFR 61 (including "any substance that may harbor or transmit pathogenic organisms," which may apply to septic tank sludge).	Must be disinfected

[a]Neutralization for protection for the liner system.

5.2 Physical and Chemical Criteria

5.2.1 Liquid Waste

The ICDF evaporation pond is designed to accept only liquid (aqueous) wastes.

5.2.2 Land Disposal Restrictions

Land disposal restrictions do not apply to the ICDF evaporation pond.

5.2.3 Heat Generation

Aqueous waste must be in a liquid form. Hot aqueous waste above the ambient temperature will not be accepted until it has cooled.

5.2.4 Gas Generation

Liquid wastes which, upon discharge into the ICDF evaporation pond, could result in the generation of toxic gases will not be accepted into the ICDF evaporation pond.

Logic for development of the maximum allowable risk-based chemical and radiological concentrations in the WAC is shown in Figure 5-1. The chemical WAC limits are shown in Table 5-2.

Table 5-2. Evaporation pond chemical waste acceptance criteria limits (to be completed in 90% submittal).

Constituent	Allowable Concentration

5.3 Radiological Criteria

5.3.1 Radiological Concentration Limits

Restrictions on the activity of radionuclides that can be placed in the ICDF evaporation pond will be determined on the basis of NESHAPs modeling, and in evaluating the potential impact to the SRPA from the ICDF evaporation pond. Radiological restrictions will also be based on a reasonably maximally exposed (RME) individual of the public calculated at 15 mREM/yr. In addition, ecological risks will be included in determining radiological restrictions.

Limits established for radionuclides will be identified in Table 5-2. Where there are two or more radionuclides present in a waste, the "sum of the fractions method as outlined in Appendix C shall be used to determine acceptability." Certain waste sources may require special handling to accommodate disposal at the ICDF evaporation pond even though the radionuclide concentrations are less than the Table 5-2 limits. Handling requirements for these waste sources shall be evaluated on a case-by-case basis. If the inventory concentration of the waste source is below the Class C limits, the waste is then acceptable for transportation to and disposal at the ICDF evaporation pond.

Waste containing greater than 10 nCi/g of TRU isotopes based on waste stream sampling will not be accepted.

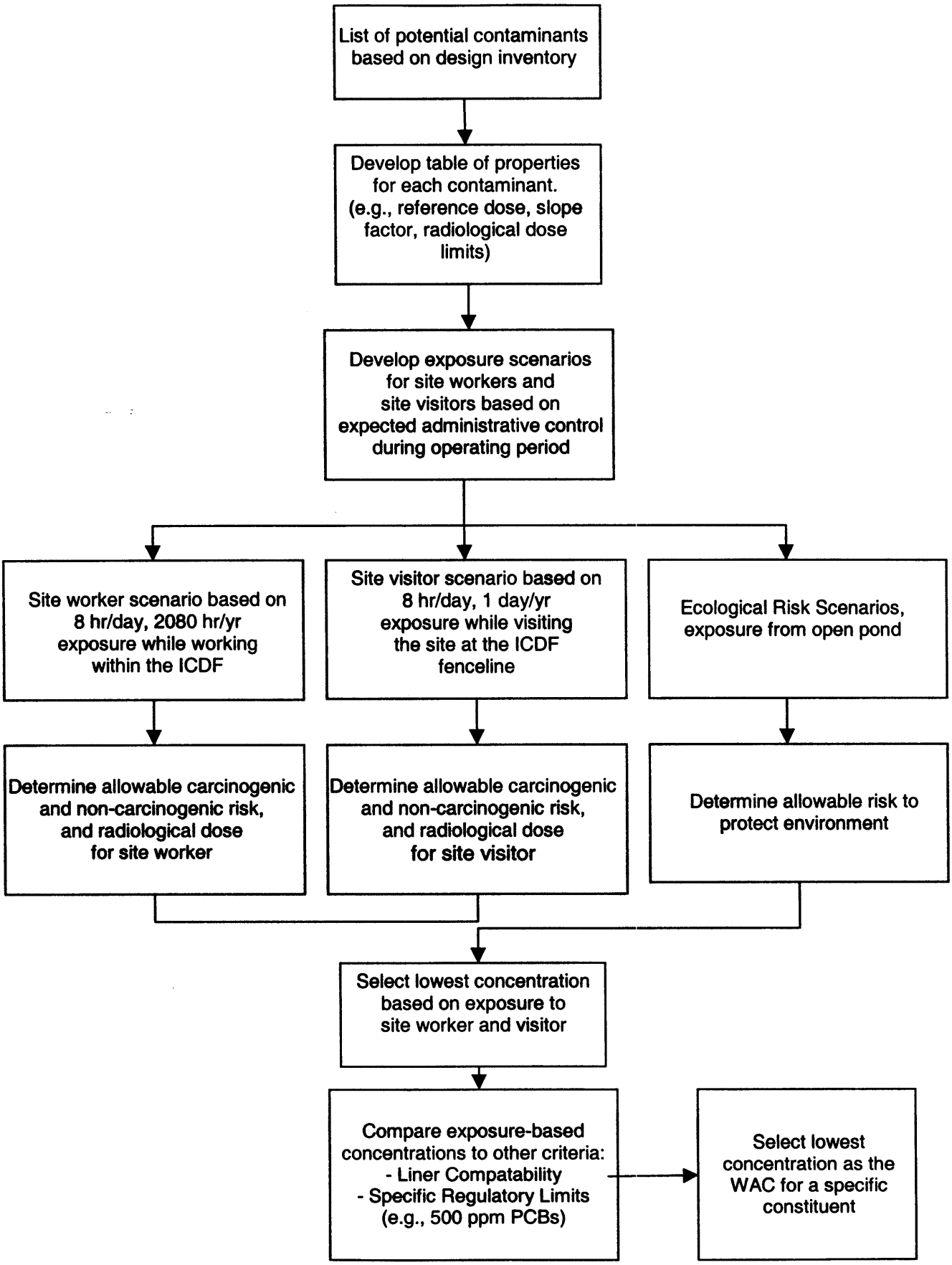

Figure 5-1. ICDF evaporation pond waste acceptance criteria development.

Table 5-3. Radiological concentration (activity) limits (to be completed in 90% submittal).

Radionuclide	Allowable Activity (pCi/g)	Allowable Total inventory (Ci)

5.3.2 Criticality Safety Limits

At the present time there are no wastes identified for disposal that might approach criticality limits. However, should some waste be identified, the generator would be required to provide all documentation to demonstrate that disposal in the ICDF evaporation pond would not approach criticality. In this case, the auditable safety analysis will demonstrate, through analysis, that the facility is a Radiological Low Hazard facility where criticality is not credible due to the quantity and form of the material. These documents are still in the development stage.

5.3.3 Remote-Handled Wastes

Remote-handled waste shall meet the applicable dose rate restrictions of DOT or an approved packaging safety analysis. Remote-handled waste shall be configured for unloading such that personnel exposures are maintained ALARA.

5.4 Packaging Criteria

Packaging of CERCLA-generated waste shall be in compliance with the OU 3-13 ROD ARARs. Container specifications are listed in Table 3-1. CERCLA-generated waste materials must be stored and transported in containers that are in good condition, are compatible with the waste, and meet the DOT regulations. The DOT regulations, which provide standards for properly packaging hazardous material and hazardous waste (49 CFR 172), must be followed to determine the proper containers for the management of each waste stream.

Packaging of all waste materials designated for ICDF evaporation pond disposal will be in compliance with DOT regulations and RCRA regulations found in 40 CFR 264 Subparts I and J. The ICDF Complex designee should be consulted prior to the generation of any new waste, to identify the specific types of containers required for the anticipated wastes.

5.4.1 Condition of Containers

Outer containers shall be in good condition, with no visible cracks, holes, bulges, substantial corrosion, or other damage that could compromise integrity.

5.4.2 Package Construction

See Table 3-1.

5.4.3 Shielding

When shielding is used to reduce the surface dose rate of a waste container, the shielding and waste must be secured to prevent shifting during handling and transportation.

5.4.4 Aqueous Waste Transfer

The majority of non-leachate waste is expected to be delivered to the ICDF evaporation pond by pumping from bulk liquid containers. This waste may arrive in water trucks, water trailers, tanks, or other containers.

5.4.5 Labeling

Waste containers shall be labeled as described in the following sections. Bulk wastes are exempt from labeling requirements at the ICDF. For unusual waste forms, special labeling provisions can be arranged with the ICDF Complex organization.

All containers used for waste storage must be properly labeled in accordance with both EPA and DOT requirements before delivery to the ICDF Complex. Each manager generating waste will ensure that each drum/container is properly marked and labeled, first while the waste is accumulated, and again before the waste is moved from the WAG site. Table 5-3 indicates the label specified for each type of waste.

Table 5-4. Label identification table.

Waste Type	Radioactive	CERCLA Waste	Pending Sampling and Analysis	CERCLA Database Barcode Label
Hazardous Waste	N/A[a]	X[b]	N/A	X
RAD	X	X	N/A	X
RAD and Mixed RAD	X	X	N/A	X
Case-by-Case (waste dependent)	X	X	X	X

a. X = applicable
b. NA = not applicable

The marking on the containers must always be clearly visible for inspection of each container, and all container labels must be placed where they are clearly visible during storage and shipment. Drums will be labeled on the top and on one side. During shipment to the ICDF Complex, a container must also display DOT labels, manifest number, gross weight, and the shipper's complete name and address. Containers of waste shall not be opened, handled, or stored in a manner that will cause leakage (40 CFR 265.173(b), IDAPA 58.01.05.009).

5.4.5.1 Radioactive Waste. As required by the INEEL Radiological Control Manual (INEEL 1996), radiation labels will be completed by a Radiation Control Technician (RCT) and placed on the top and on two opposing sides of the container.

5.4.5.2 CERCLA Waste. Standardized labels are available that provide the required information and blanks for site-specific information. All CERCLA remediation waste will be labeled with a "CERCLA Waste" label that includes an accumulation start date, waste description, applicable codes, and the generator's name. Figure 5-2 provides an example of a standard label.

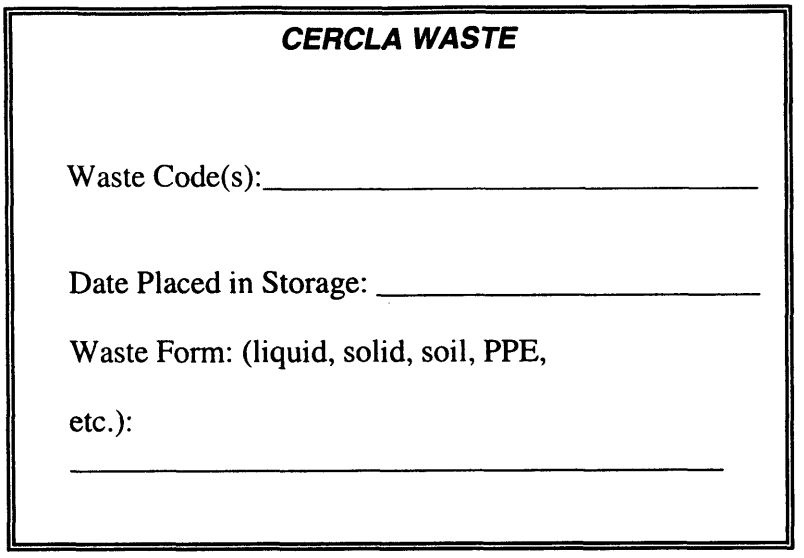

Figure 5-2. Standard CERCLA waste label.

5.4.6 Bulk Containerized Aqueous Waste

The majority of non-leachate waste is expected to be delivered to the ICDF evaporation pond by pumping from bulk liquid containers. This waste may arrive in water trucks, water trailers, tanks, or other containers. Waste streams that comply with the ICDF evaporation pond WAC can be accepted for disposal at the ICDF evaporation pond as bulk shipments.

6. REFERENCES

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